

## ROLE OF COMMUNITY BROADCAST MEDIA IN THE DISSEMINATION OF CLIMATE CHANGE INFORMATION AMONG SMALL-HOLDER FARMERS IN ISIMANI DIVISION, IRINGA RURAL DISTRICT

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### **Abstract**

*Broadcast media improve the way people can access information about climate change. This role is undeniable for a country such as Tanzania, which is facing direct impacts of threats of the current and future climate change. This paper is based on a study conducted in Isimani Division, Iringa Rural District, Tanzania. Cross-sectional research design was adopted involving a sample size of 120 respondents. Questionnaires, Key Informant Interviews and Focus Group Discussions were used to collect Data. IBM SPSS Statistics software and content analysis were used to analyse data. The findings show that community broadcast media are important channels for accessing and disseminating climate change information for awareness creation on the appropriate adaptation and mitigation mechanisms against the negative impacts of climate change. The recommended adaptation and mitigation strategies include the use of drought-tolerant crops, the use of early maturing varieties, intercropping, the use of organic fertilizers and crops residual management method. However, low income, language barrier, unreliable broadcast network, low education level, inadequate climate change related programmes, and inadequate power supply were challenges that impeded local communities from accessing information on climate change adaptation and mitigation strategies. The study recommends that broadcast media owners and journalists in Tanzania should disseminate information for raising community's awareness on the aspects regarding adaptation and mitigation mechanisms to the impacts of climate change.*

**Keywords:** Radio, television, climate change, adaptation, mitigation, information dissemination

### **1.0 INTRODUCTION**

Climate change is one of the greatest global challenges, which have adversely affected the livelihoods of people and posed serious risks to the lives of local and international communities. Consequently, the efforts of reducing extreme poverty among the communities have been affected by climate change (IPCC, 2007; URT, 2007; Hepworth, 2010). Sub-Saharan African (SSA) countries are particularly vulnerable to the impacts of climate change (EAAE, 2010; Nzuma *et al.*, 2010; Dahou, *et al.*, 2012). The most affected people are the local communities particularly those

residing in rural areas because their adaptive capacities are very low, furthermore, their livelihoods depend on rain fed small-scale agricultural activities (Lema and Majule, 2009; Lwoga, 2010; Kamuzora, 2011; COMESA *et al.*, 2011; Viljoen, 2013; Crawford and Terton, 2016). With persistent climate change and vulnerability, rural livelihood in SSA region is subjected to multiple shocks and stresses leading to community vulnerability (Kabede and Nicholas, 2010). The adverse impacts of climate change are now evident almost everywhere. Such impacts including rising temperature and changes in precipitation are undeniably clear and are already affecting ecosystems, biodiversity, and people. It is believed that, the impacts of climate change are and will continue to be more pronounced in poor countries such as Tanzania (WWF, 2006; URT, 2007).

Changing climate in Tanzania is evidenced by different studies. The analysis of observational data in Tanzania carried out by New *et al.* (2006) shows a clear evidence of decreasing numbers of cold days and nights and decreasing of cold waves. Daily temperature observations show only small increasing trends in the frequency of hot days, but much larger increasing trends in the frequency of hot nights, especially in the months of December through February. Similarly, rainfall trends in Tanzania show significant decrease in annual rainfall, notably of the 'long' rains (March to May). Annual rainfalls have decreased at an average rate of 2.8mm per month, which is 3.3 percent per decade (McSweeney *et al.*, 2010). Thus, the projections show that by 2100 Tanzania expects to have a decrease in rainfalls of between 0 to 20 percent (Mwandosya *et al.*, 1998). Such major changes in rainfall patterns will inevitably have severe consequences to society such as repeatedly observed droughts and floods in the southern parts of Tanzania including Isimani Division of Iringa Rural District (Hulme *et al.*, 2001). Similarly, Kijazi *et al.* (2012) indicate that birds such as *Mbungu* (Vultures) and trees such as *Misombe* (fruit trees) that were used as rainfall indicators by local communities in Isimani Division of Iringa Rural District have disappeared due to repeated drought. Agricultural production in rural Tanzania relies mainly on rainfall, but its outputs are severely compromised in many parts of the country, particularly among subsistence farmers (UNFCCC, 2007). Though several adaptation and mitigation options have been developed to cope with current climate change, such adaptation and mitigation strategies may not be sufficient for future changes of climate if such strategies are not well known and communicated to people (Boko *et al.*, 2007). Farm Radio International (2009) noted that farmers could prepare for mitigation and adaptation to the negative effects of climate change only if they understand it and know its impacts. Adapting and mitigating to climate change involves cascading decisions across a landscape made up of various agents and it involves different actions. Actions associated with building mitigation and adaptive capacity may include communicating climate change information for building awareness of potential impacts, maintaining well-being, protecting natural resources, maintaining economic growth, or exploiting new opportunities (Adger, *et al.*, 2005). According to Sachsman (2000) public awareness raising through mass media has played a major alternative role in shaping people's perceptions to and awareness of environmental issues since the 1960s. In addition, community accuracy of knowledge are strong predictors of climate change mitigation and adaptation attitudes, but as with most science-based issues, information about climate change that reaches the public passes first through the mass media (Falaki and Adegbija, 2013).

There is evidence that community broadcast media such as television and radio are amongst the most accessible sources of information that are capable to bring the reality of climate change impacts directly into people's homes. They help to raise public attention to climate change impacts through the relevant climate information, which include climate data combined with demographic,

economic, social, and environmental information (Adger, *et al.*, 2005. Among the other functions of the broadcast media are those of sensitising and undertaking various education programmes on environmental issues thereby cultivating public interest, commitment and awareness on the adaptation and mitigation strategies towards the impacts of climate change (URT, 2012). Chand (2017) observes further that broadcasting media are important information channels that transmit useful information about climate change to the public. They act as educational tools for raising awareness. Realistically, societies can adapt and mitigate negative impacts associated with climate change if they are aware and knowledgeable about this concept and its associated potential impacts (Reid *et al.*, 2009). Increasing knowledge and awareness on climate change among rural communities is an essential starting point in building adaptive capacity. Without comprehending what to do, individuals would be left feeling overwhelmed and frightened, or blissfully ignore the magnitude of the issue through denial (Moser and Dilling, 2004). Therefore, this calls for the need to use all the available communication opportunities such as radio and television to access climate related information for enhancing adaptive capacities among rural communities.

## **2.0 LITERATURE REVIEW**

### **2.1 *Access to and usage of community broadcast media in the dissemination of adaptation and mitigation measures related climate change information***

The use of radio as a medium of information transfer for assisting development in particular rural development has been established worldwide. Globally, people in the rural settings use radio primarily as a source of news and entertainment. In the developing countries, radio is the powerful and effective medium of disseminating information and knowledge related to agriculture (Nakabugu, 2001; FAO, 2001). Other scholars such as Noble *et al.* (2014) have acknowledged that successful implementation of climate change adaptation and mitigation measures depends upon the availability and accessibility of information. As the farmers receive useful information from radio and share them, gradually they bring changes in farming methods by applying new technologies (Daramola, 2003; Khanal, 2011; Ango *et al.*, 2013).

Radio is listened to almost equally for the news and entertainment in developing countries. On average, 57percent of listeners across nine Sub-Saharan countries listen to the radio daily for news, 58 percent for music, 29 percent for religion, 18 percent for call-ins, and 13 percent for information and 9 percent for talk show (Balancing Act, 2008). Rural populations can have their own community radio stations, which are normally operated, owned, and financed by the communities they serve (Al-Hassan, 2011). Such a community radio can enable rapid and accurate dissemination of information on various issues such as agriculture, livestock keeping, natural resources, markets, and climate change among others (CSDI, 2009). Radio stimulates learner's participation, it provides a sense of immediacy, and communicates quickly and cheaply in various languages (Juman, 2009). This implies that the radio can be used to communicate developmental information such as agricultural, environmental and climate change issues to farmers in any language, which farmers can easily understand to increase their awareness. This is consistent with the findings by Bernard *et al.* (2014) and Okaka *et al.* (2017) who reported that radio is the most common mass medium in the African countries through which vital information can be disseminated to rural farmers for enhancing sustainable development.

In Tanzanian context, radio remains the most widespread and effective mass communication tool to most people particularly rural communities as it can overcome problems of distance, illiteracy and language diversity better than any of the other media (RTS, 2009; URT 2012). Accessibility of Radio has been attributed to its effectiveness as a communication medium to populations with low literacy levels, low income, and poor access to other forms of media (FAO, 2001). Many developing countries including Tanzania began liberalizing airwaves in 1993 allowing for the development of privately and commercially run stations (Amienyi, 2004). The study conducted by URT (2016) indicates that, by December 2015, Tanzania Mainland had 125 registered radio stations. Out of these, 9 radio stations are owned by public and local government, 5 radio stations are owned by communities, 47 are non-commercial radio stations and 64 are commercial radio stations. A study by NBS and Marco (2005) revealed that the level of household ownership of radio sets in Tanzania was 58 percent in 2004, with the ownership in urban and rural households being 76 and 52 percent respectively. Another survey by InterMedia (2004) found that 67 percent of the population watched television with 34 percent watching at least once a week and 92 percent of the population listened to the radio at least once a week. A study by Steadman (2005) revealed that radio access in Tanzania was 95 percent. A study by Bernard *et al.*, (2014) indicated that 71.4 percent of the population in Tanzania use radio as a source of seeking for various pieces of information. With this level of radio ownership and access, it is evident that the repackaged climate change information with regard to adaptation and mitigation can also be accessed and disseminated to the rural communities through this form of media for raising community awareness (Nyagonde, 2014).

Television is less widely available in Africa, especially in rural areas, although its access and availability are growing rapidly. Compared to other communication tools, television gives quick, reliable, and attractive information regarding various activities relating to agriculture (Halakatti *et al.*, 2010) because both the listening and seeing senses are all involved. Television also provides information in a more convincing manner so that most of the observed information is adopted. According to Halakatti *et al.* (2010), the highest percent of agricultural information was obtained from television in India. A survey by BBC World Service Trust (2006) in 17 African countries indicates that more than 50 percent of population watched television at least once a week. According to the Tanzania Communication Regulatory Authority (TCRA), there are 26 television stations in the country (TCRA, 2014). Among these, 16 are small community stations at a community level, which are run by District Councils all over Tanzania, and are based at district headquarters (DAL, 2005). As a communication channel, televisions act as dissemination pathways, which are used by information providers to disseminate information to users (Garforth 1998). They convey information and key conclusions generated through broadcasting.

## ***2.2 Contributions of community broadcast media in the dissemination of adaptation and mitigation related climate change information to small- holder farmers***

Community broadcast media serves a local community or specific interest group (CMA, 2002). Through community broadcast media, vital information for adaptation and mitigation to climate change, information on better farming methods, improved seeds, timely planting, agro-forestry, better harvesting methods, soil conservation, marketing, post-harvest handling, crop diversification, water management, food security and sensitisation of communities, donors, and governments (IPCC, 2007; Mudombi *et al.*, 2014) can be passed on through the use of television

and radio. Community broadcast media can also play a vital role in disseminating essential information to the farmers timely in the situations of urgency and emergency. For example, farmers can be informed promptly and swiftly about diseases and pest control, floods, and changing weather conditions, which in turn can increase their level of knowledge and influence behaviour on appropriate adaptation and mitigation strategies (Nakabugu, 2001). As FAO (2001) and Daudu *et al.* (2009) acknowledge, radio and television are the most important communication medium for communicating with the rural populations in the developing countries. Such media are known for their ability to influence, inform, and persuade large audiences to think or do something. In the changing climatic scenario, television and radio provide access to educational and other pieces of information (Sife, 2010) by which people can use to create awareness for adapting and mitigating the negative impacts caused by climate change. Similarly, URT (2012) revealed that the introduction of broadcast media brought about meaningful life whereby stories about climate and environmental change appear in documentaries, interactive talk shows, drama, and music helping communities to learn more about these impacts and share their experiences on how to respond to them. Furthermore, the findings of the study by Bernad *et al.* (2014) showed that small-holder farmers appreciated the role played by broadcast media in improving their decisions making, including how to apply fertilizer, and how, when, and which crops to plant depending on the seasons of the year and weather conditions.

### ***2.3 Barriers in the usage of community broadcast media for disseminating information on adaptation and mitigation practices***

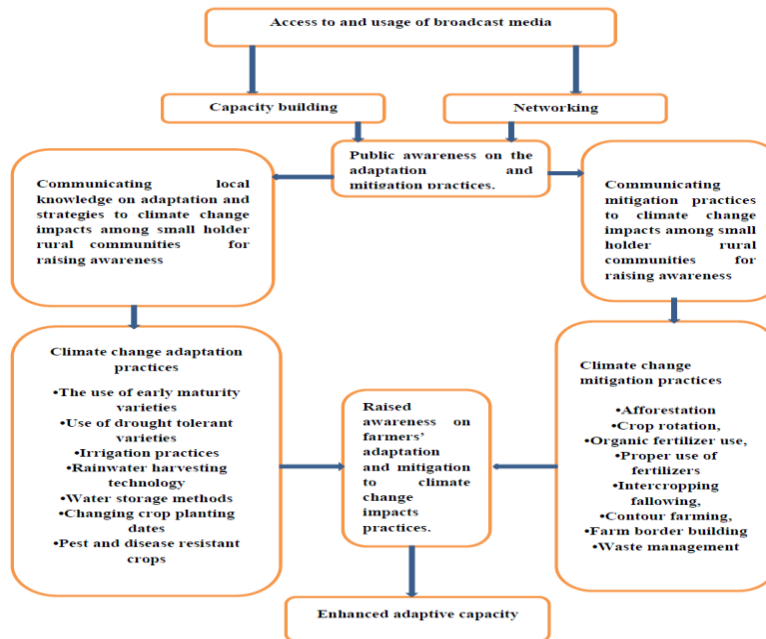
Many factors have been cited as constraints against effective access, usage of community broadcast media for the dissemination of adaptation, and mitigation related climate change information. Generally, these factors can be considered in terms of lack of awareness of appropriate climate change adaptation and mitigation strategies within the communities. This is associated with lack of knowledge on climate change issues, limitation of the resources for the implementation of climate change adaptation and mitigation activities which again is associated with low income; unreliability of power, poor broadcast network coverage and barriers within governments and donor agencies. A study by Momudu (2002) cited illiteracy as the major barrier against obtaining information making it difficult for the farmers to understand the information because it is often written in alien languages such as English and French among many others. This implies that only those who can read English can access and use the information. Mbwana (1994) pointed out that, broadcast media are too expensive for farmers to afford, which makes them unable to access agricultural information. Furthermore, a study by Ugboma (2010) identified factors hindering the flow of agricultural information such as low literacy level of farmers and unreliable supply of electricity. The study by Agwu *et al.* (2008) identified inappropriate broadcasting time, language barriers and lack of feedback as among the major constraints hindering effective access to, and use of information prepared for farmers. The TV programmes were explicitly described as too short and as being inappropriately scheduled. It was also observed that the radio programmes were scheduled at a time when farmers were busy with farming activities and thus they could not listen to them. Furthermore, Agwu *et al.* (2008) showed that, the language used in presenting the programmes, inability of farmers to ask relevant questions and poor feedback from radio presenters hindered farmers' access to and use of information. Most farmers in the rural areas rely on the radio for awareness and knowledge of various socio-economic issues, including agricultural development, thus, poorly structured radio programmes and inadequate feedback deny farmers the opportunity of accessing and using information to enhance

their knowledge. Inadequate knowledge reduces farmers' confidence in the introduced innovations and develops a negative attitude towards trialability, observability, persuasion, decision making and application attributes (Rogers 2003).

Despite that broadcast media play a crucial role in the dissemination of information, communication, and availability of climate change information in Tanzania are still inadequate. A lot of data and information related to climate change are being collected but they are not effectively disseminated to the intended audiences for raising their awareness about adaptation and mitigation strategies. This is partly contributed by the inadequate broadcasting of climate change issues (URT, 2012). There is also scarcity of empirical research on the role of community broadcast media in the dissemination of information on climate change in Iringa Rural District (Sife, 2010; Mpehongwa, 2009; Al-Hassan *et al.*, 2011). The available studies have largely focused on the relationship between broadcast media and livelihood improvement. Since the agriculture is among the most affected sectors by climate change, the present study therefore focused on the role of community broadcast media in the dissemination of information on the adaptation and mitigation strategies towards the impacts of climate change in agriculture for an improved livelihood in Isimani Division, Iringa Rural District, Tanzania. Specifically, this paper examined the role of community broadcast media in the dissemination of information on the adaptation and mitigation strategies against the impacts of climate change in Isimani Division, Iringa Rural District. It also identified adaptation and mitigation practices mostly preferred by the communities in the study area and the barriers towards access and usage of community broadcast media for the dissemination of information on adaptation and mitigation practices in Isimani Division, Iringa Rural District.

### **2.3.1 Conceptual framework**

The conceptual framework used in this paper was adapted with a modification from Communication for Development (ComDev) approach for broadcast media applications. ComDev combines a range of participatory methods and media from community broadcast media to ensure equitable access to information, knowledge sharing, and inclusive decision-making for farmers and rural communities (FAO, 2014). The model was used in this study to formulate research objectives and questions. The model was also used as it incorporates both aspects of community-based adaptation and mitigation practices, broadcast media tools for enabling information dissemination to raise awareness for enhancing adaptive capacity of local communities, which are all the subjects of this study. From Figure 1, it is assumed that farmer' access to and usage of broadcast media will facilitate their capacity building and networking which will result into awareness raising on climate change adaptation and possible mitigation strategies. The raised awareness is assumed to have resulted from communicating knowledge on the adaptation and mitigation strategies from community broadcast media, which in turn will enhance the adaptive capacity of rural community. The positive impacts, better adaptation, and mitigation options lead to sustainable livelihoods, increased vegetation, and forest cover. This will then decrease the intensity of agents of climate change in the atmosphere. Consequently, the global temperature will decrease. The climate will therefore stabilize, variations in climate will be arrested, and hence mitigating the impacts of climate change.



**Source:** Adapted from ComDev approach for broadcast media applications (FAO, 2014)

### 3.0 METHODOLOGY

This paper is based on the study conducted in Isimani Division, Iringa Rural District. The study adopted a cross-sectional research design using both qualitative and quantitative research approaches, with quantitative research assuming the dominant status. The design enabled data to be collected at a single point in time and allowed for questionnaire survey (Sedgwick, 2014). The design enabled data to be collected from a large number of subjects; it reduced cost and saved time (Saunders *et al.* (2000).

Sampling procedures in this study involved multi-stage sampling technique with four stages. In the first stage, Isimani Division was purposefully selected from the list of nine divisions in Iringa Rural District because the division is severely affected by the impacts of climate change. In the second stage, five wards from among six in Isimani were purposefully selected because they were involved in crop production by small-holder farmers. In the third stage, one driest village in each ward was purposefully selected to make five villages. The last stage involved the selection of households. Key informants were purposively selected based on their active membership in the community, having adequate information about the topic, and possessing a television or radio set. To get in-depth information, 10 informants were interviewed including two agricultural extension officers, five village leaders, and three broadcast personnel. Two to three key informant interviews were planned for each village.

The sampling units for the questionnaire-based survey were those households that had at least one set of TV or radio, and the respondents were the household heads. This study adopted a Posel's (2001) gender unbiased definition which considers household head as either a male or female adult

person who usually lives in the household and is recognized by other household members as the household head. The sample size for this study was 120 households.

Quantitative data resulting from survey research were collected using questionnaire whereas qualitative data were obtained using Key Informant Interviews and Focus Group Discussions. Data for this study were collected from June to December 2014. Quantitative data were analysed using IBM Statistical Package for Social Sciences (SPSS) Statistics software Version 20 based on descriptive statistics including frequencies, means, and percentages. Qualitative data were analysed using content analysis by carefully studying and interpreting data gathered by tape recorder; transcribed for analysis and by note taking in order to establish meaningful qualitative information.

#### 4.0 RESULTS AND DISCUSSIONS

##### 4.1 Demographic and socio-economic characteristics of respondents

Demographic and socio-economic characteristics of the respondents covered personal information including age, sex, marital status, educational level, household size, farm size, power access and distance to the market. These variables have some influence on the adaptation and mitigation practices of small- holder farmers in Isimani Division, Iringa Rural District. The results in Table 1 indicate that 65 percent of the respondents were male and 35 percent were females. The age bracket of 36-50 years constituted the majority of the respondents in the study area and only 42 percent of the respondents were married. The findings show a high literacy rate as 74 percent of the respondents had completed primary school education. Deressa *et al.* (2008) observed that access to and use of information for climate change adaptation were promoted by household characteristics, which include the level of education, sex and age of the head of the household and households size. A higher level of education is linked to the wider access to information on climate change and variability, higher agricultural productivity and improved technologies. Thus, education plays a major role in creating awareness, which, in turn, assists in farmers' adaptation measures. Slightly more than half (58%) of the respondents were characterized as having 4 to 7 members of households. It was also found that more than 63 percent of the households owned one to five acres of farm size. Depending on accessibility and situational setting, farm size can have an effect on the rate of adaptation and mitigation to climate change.

**Table 1: Characteristics of respondents at Isimani Division**

Variable		Frequency	Percent
Age category (in years)	18-28	29	24.2
	29-35	29	24.2
	36-50	33	27.5
	51-60	21	17.5
	60+	8	6.7
Sex	male	78	65.0
	female	42	35.0
Educational level	primary	89	74.2
	secondary	17	14.2
	certificate, diploma	3	2.5
	Adult education	1	0.8
	None(illiterate)	10	8.3
Marital status	single	39	32.5



	marriage	50	41.7
	divorced	15	12.5
	widow	16	13.3
Farm size(in acre)	less than 1 acre	3	2.5
	1 to 5 acre	75	62.5
	6 to 20 acre	42	35.0
Members in household	1-3	35	29.2
	4-7	70	58.3
	8 and above	15	12.5
Market distance(in km)	0-6	115	95.8
	7-12	4	3.3
	25-30	1	0.8
Power access	yes	51	42.5
	no	69	57.5

Inadequate power supply is a challenge in most rural areas in Tanzania including Isimani. The results in this study indicated that only 43 percent of the households in Isimani Division had electricity whereas slightly more than half (58%) of the households did not have access to electricity. The results show further that most of the respondents had access to solar energy systems, which could meet small energy demands such as lighting and charging some electrical devices such as cell phones. Field observation experience indicated that inadequate power supply impaired the use of TV sets to access information. This is because by the time rural community members were ready to follow broadcast programmes from their TV sets, they were unfortunately hindered by power cut-off. Likewise, because of frequent power cut-offs radio frequencies reception were also poor. Majority (80%) of the respondents reported to have travelled up to six kilometres to reach the market from the farm. Long distance to the market place could hinder them from selling farm produces which in turn could enable them to buy their own broadcast ICT tools for accessing climate change information regarding adaptation and mitigation practices.

#### **4.2 Access to and usage patterns of broadcast media**

The first research question established access and usage patterns to broadcast media in Isimani Division. This question was addressed by identifying ownership of radio and television, media preference, preferred time for listening/watching radio and television, frequency of listening to radio, and watching television and the preferred locations for listening/watching radio and television. The study findings in Table 2 indicate that the majority (93%) of the respondents owned radio sets whereas only (28%) of the respondents owned television sets. These findings suggest that radio was more efficient medium in serving Isimani Division masses because it is affordable as compared to television. The majority owned radio sets because they are cheap to buy, locally available because they are even sold by petty traders in some retail shops in the respective villages, and even the batteries were easily available and they could use them for some weeks before they buy new ones.

**Table 2: Access to radio and television**

<b>Variable</b>	<b>Category</b>	<b>Frequency</b>	<b>Percent</b>
Radio set	none	8	6.7
	1	90	75.0

	2	18	15.0
	3	4	3.3
Television set	none	86	71.7
	1	34	28.3

In Isimani Division, network is available for radio stations namely Furaha FM, Ebony FM, Country FM and Nuru FM, which are located in Iringa Region. Others are TBC FM, Radio One, and RFA. However, among all these radio stations, Ebony radio (21%) was the most listened to followed by TBC FM (16%) and RFA (8%) and Furaha (8%). Concerning television, 32 percent of the respondents preferred watching TBC1 followed by Star TV (16%) and ITV (11%). Seventy eight percent of the respondents reported to have been listening to radio early in the morning and 77.5 percent were watching television at night every day. However, slightly more than half (57%) of the respondents preferred listening to the radio at home, while slightly over one-third (34%) of the respondents watched television at neighbour’s homes. The study findings show further that 71 percent of the respondents preferred listening to local and international news. Likewise, 86 percent of the respondents preferred to watch local and international news. During an interview a small-holder farmer in Isimani Ward had this to say,

*“... Whenever I have a chance, I prefer listening to the programme named Participatory Agricultural Development Education Programme (PADEP) for obtaining agricultural information.”*

This programme is aired by the state-owned radio station –TBC1. In one of the FGDs, a respondent pointed out,

*“...I prefer following Inuka (rise up) programme which is aired by RFA as sometimes I could get environmental conservation, climate change, as well as agricultural information”.*

In another occasion, a small- holder farmer testified that:

*“...the weather forecasting information provided by Tanzania Meteorological Agency (TMA) and broadcasted by ITV and TBC1 is of particular importance to farmers. The information helps me to plan for the preparation of farm and planting seasons, types of crops to plant and predictions for the start of rains”.*

In this case, environmental institutions and Non-Governmental Organisations (NGOs) may sponsor short messages such as climate change adaptation and mitigation jingles which can be aired and broadcasted at the very beginning, during and at the end of the radio and TV programmes to capture a big number of audiences. For example, if a short message of few seconds addressing climate change issues can be aired before news bulletin or any topical discussion programme had started, it is obvious a good number of people will get an opportunity to listen or watch those short messages. Furthermore, people could get a chance of discussing it because it is timely and addresses issues that are of particular interest to them.

### **4.3 Climate change adaptation practices preferred by small-holder farmers in Isimani Division**

Isimani Division is an equatorial area, but it is also a dry area because of environmental degradation resulting from unreliable and unpredictable rainfall. When the respondents were asked to show how they perceived a change in climate, the majority (95%) cited a decrease in rainfall as an indicator and 92 percent cited the rise in temperature as an indicator. When asked to provide three key adaptation practices, 31 percent reported to prefer a change in crop planting dates in

coping with the unpredictable rainfall, 28 percent preferred use of drought-tolerant crops such as sorghum, millet and sunflower, and 23 percent preferred the use of early maturing crop varieties, mainly maize and beans.

**Table 3: Climate Change Adaptation Practices**

Climate Change Adaptation practices	Responses	Percent
Early maturing varieties	66	22.5
Drought- tolerant varieties	83	28.3
Pest and disease resistant crops	5	1.7
Water harvesting using tied ridges and mulching farms	32	10.4
Water storage methods	7	2.4
Changing crop planting dates	90	30.7

#### **4.4 Climate change mitigation practices preferred by small-holder farmers in Isimani Division**

Practices such as afforestation/re-afforestation programmes, use of organic fertilizers, farm border building, proper use of fertilizers, inter-cropping, and contour farming are considered as appropriate strategies for enhancing conservation and sustainable use of land resources which in turn would lead to climate change mitigation in Isimani Division. However, some of these practices were less applied while others were predominantly practised by small-holder farmers (Table 4). The findings show that slightly more than three-quarters (77%) of the respondents preferred inter-cropping in reducing soil erosion. Nearly three-quarters (74%) of the respondents preferred organic fertilizers. According to USAID (2008), a combination of different friendly crop varieties in a farm prevents soil erosion and preserves moistures. Furthermore, the results in Table 4 indicate that crop rotation, re-afforestation, use of organic fertilizers and crop residual management were the key mitigation strategies practiced by over 50 percent of the respondents.

**Table 4: Climate change mitigation practices**

Mitigation practices	Frequency	Percentage
Crop rotation	60	50.0
Intercropping	92	76.7
Re-afforestation	70	58.3
Contour farming	20	16.7
Farm bordering	48	40.0
Organic fertilizers	89	74.2
Use of fertilizers	43	35.8
Crop residual management	70	58.3

#### **4.5 Barriers to accessing and usage of community broadcast media for adaptation and mitigations for climate change impacts practices**

The respondents were asked to mention challenges they encountered in accessing and using community broadcast media for obtaining information about adaptation and mitigation against the potential impacts of climate change. The findings in Figure 2 show that, the main constraints was associated with low income (38.1%) which is again related to the lack of a common market for selling agricultural products. During an in-depth interview, one respondent from Mkungugu Village had this to say,





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